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EXAMINER

AFSHAR, KAMRAN

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/549,242	Applicant(s) OTSUKI ET AL.	
	Examiner KAMRAN AFSHAR	Art Unit 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-19 and 21-42 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) See Continuation Sheet is/are rejected.
- 7) ☒ Claim(s) 3, 5, 8/2, 9/2, 10/2, 11/2, 13/2, 14/10/2, 15/14/10/2, 16/2, 17/2, 19, 22, 24, 27/21, 28/21 29/21, 30/21, 32/21, 33/29/21, 34/33/29/21, 38, 39/13/2, 40/39/13/2, 41-42/32/21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/22/2008</u> | 6) <input type="checkbox"/> Other: _____ |

Continuation of Disposition of Claims: Claims rejected are 2, 4, 6/4, 7/4, 12/2, 17/2, 18, 21, 23, 25/21, 26/21, 28/21, 31/21, 35/21, 36/21, 37.

DETAILED ACTION

1. The indicated allowability of claims 2, 4, 6/4, 7/4, 12/2, 18, 21, 23, 25/21, 26/21, 28/21, 31/21, 35/21, 36/21, 37 are withdrawn in view of the newly discovered reference(s) to Kasami (U.S. Pub. No. ;2002/0181492 A1). Rejections based on the newly cited reference(s) follow.

Drawings

2. The drawings were received on 07/18/2008. These drawings are acceptable. The objection of drawings has been withdrawn.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, 12/2, 17/2, 18, 21, 23, 28/21, 31/21, 35/21, 36/21, 37, are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA) in view of Kasami (U.S. Pub. No. ;2002/0181492 A1).

With respect to claims 2, 18, 21, 23, 37, APA discloses a wireless packet communication (See APA e.g. Fig. 49) method for simultaneously transmitting from a transmit-side STA a wireless packet by using a wireless channel (or sub-channel) determined to be idle by both of physical carrier sense and virtual carrier sense when multiple wireless channels (or sub-channels) are provided between the transmit-side STA and one or more receive-side STAs (See APA , the physical carrier sense determining a wireless channel to be busy or idle from received power (See APA e.g. physical carrier senses the received power of channel, virtual carrier sense, Idle or busy status, wireless packet, Page 1, ¶ [0005]) ,

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the virtual carrier sense determining a wireless channel to be busy during a set transmission inhibition time (See APA, e.g. virtual carrier sense NAV = "0" is idle, not being "0" is busy, two wireless channels (or paired channels or adjacent channels), Page 2, ¶ [0006]). However, APA does not setting, by said transmit-side STA, time ($T_{max} + T_s$) as transmission inhibition time to a paired wireless channel (or sub-channel) other than a wireless channel (or sub-channel) which requires longest transmission time T_{max} among wireless channels used for simultaneous transmission, the transmission inhibition time used in the virtual carrier sense, the time ($T_{max} + T_s$) obtained by adding predetermined time T_s to the longest transmission time T_{max} . In an analogous field of endeavor, Kasami also teaches a wireless packet communication (See Kasami e.g. Page 1, plurality of channels, ¶ [0003]) method for simultaneously transmitting from a transmit-side STA a wireless packet by using a wireless channel (or sub-channel) (See Kasami e.g. access point, STAs, CSMA, packet transmitted, Lines 1-11 of ¶ [0005]). Further Kasami teaches the concept of setting, by the transmit-side STA (See Kasami e.g. Access point 1 of Fig. 1), time ($T_{max} + T_s$) as transmission inhibition time (See Kasami e.g. inhibit transmission mode, Page 2, ¶ [0017]) to a paired wireless channel (or sub-channel) (See Kasami e.g. Page 12, ¶ [0166]) other than a wireless channel (or sub-channel) which requires longest transmission time T_{max} among wireless channels used for simultaneous transmission, the transmission inhibition time used in the virtual carrier sense, the time ($T_{max} + T_s$) obtained by adding predetermined time (See Kasami e.g. predetermined time, adding time, Page 5, ¶ [0085]) T_s to the longest transmission time T_{max} (See Kasami e.g. $te_1 = ts_1 + Trs_1$, $te_2 = ts_2 + Trs_2$, and $te_3 = ts_3 + Trs_3$, $temax$, Fig. 1). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to provide above teaching of Kasami to APA to provide wireless communication apparatus for executing collision access control in accordance with Carrier Sense Multiple Access Collision Avoidance protocol, to transmit and receive data packets using first and second radio channels between the wireless communication apparatus and the first and second station units for determining an effective transmission timing as suggested (See Kasami e.g. Kasami e.g. Page 2, ¶ [0019], Page 6, ¶ [0088]).

Regarding claims 12/2, 28/21, 31/21, 35/21, it is obvious that when transmission data is generated, transmitting, by the transmit-side STA (See APA, the physical carrier sense determining a wireless channel to be busy or idle from received power, physical carrier senses the received power of channel, virtual carrier sense, Idle or busy status, wireless packet, Page 1, ¶ [0005]), a wireless packet using the wireless channel determined to be idle after waiting until all wireless channels are determined to be idle by the physical carrier sense and the virtual carrier sense (See APA, e.g. virtual carrier sense NAV = "0" is idle, not being "0" is busy, two wireless channels (or paired channels or adjacent channels), Page 2, ¶ [0006]).

Regarding claims 17/2, 36/21, it is obvious that receive-side STA includes a unit which sets transmission inhibition time to a wireless channel receiving a wireless packet when the received wireless packet has the set transmission inhibition time, and which transmits an ACK packet to said transmit-side STA when a wireless packet directed to the own STA has been normally received, the ACK packet including the transmission inhibition time set in the paired wireless channel; and said transmit-side STA includes a unit which updates the transmission inhibition time set for the paired wireless channel to transmission inhibition time of a paired wireless channel included in a corresponding ACK packet when receiving the ACK packet within a predetermined period of time after having transmitted said wireless packet (See Kasami e.g. packet 201-1, Ack Pack, of Figs. 14, 22-25).

5. Claims 4, 6/4, 7/4, 25/21, 26/21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (APA) in view of Mochizuki (U.S. Pub. No.: 2006/0154628 A1) and further in view of Kasami (U.S. Pub. No. ;2002/0181492 A1).

With respect to claim 4, APA discloses a wireless packet communication (See APA e.g. Fig. 49) method for transmitting from a transmit-side STA a wireless packet by using a wireless channel determined to be idle by both of physical carrier sense and virtual carrier sense when multiple wireless

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channels are provided between the transmit-side STA and one or more receive-side STAs (See APA, the physical carrier sense determining a wireless channel to be busy or idle from received power (See APA e.g. physical carrier senses the received power of channel, virtual carrier sense, Idle or busy status, wireless packet, Page 1, ¶ [0005]), the virtual carrier sense determining a wireless channel to be busy during a set transmission inhibition time (See APA, e.g. virtual carrier sense NAV = "0" is idle, not being "0" is busy, two wireless channels (or paired channels or adjacent channels), Page 2, ¶ [0006])). However, APA does not teach the method characterized by comprising setting transmission inhibition time to a paired wireless channel by the transmit-side STA, the paired wireless channel being a wireless channel affected by leakage from a transmitting wireless channel, the transmission inhibition time being used in the virtual carrier sense. In an analogous field of endeavor, On the other hand, Mochizuki teaches the concept of the paired wireless channel being a wireless channel affected by leakage from a transmitting wireless channel (See Mochizuki e.g. local channel, paired (or adjacent) channels of Fig. 1, leakage adjacent channel power, Page 2, Lines 1-4 of ¶ [0024], and Fig. 4). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to provide above teaching of Mochizuki to Hirano and APA providing a method and or a system using the carrier sense multiple access method and interference suppression method thereof, and more particularly, to a receiver that can improve the adjacent channel interference characteristic among a plurality of base stations and terminals and interference suppression method thereof as suggested (See Mochizuki e.g. Page 1, ¶ [0001]). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to provide above teaching of Hirano to APA to provide a method and or a system such that the idle time and transmission time of header to be added to the data are included (See Hirano e.g. Page 1, Lines 4-5 of ¶ [0009]) and or setting of the longest transmission time of the data relating to continuous data or the maximum capacity of the data is needed for the purpose or power saving (See Hirano e.g. Page ¶ [0106]). On the other hand, Kasami also teaches a wireless packet communication (See Kasami e.g. Page 1, plurality of channels, ¶ [0003]) method for simultaneously transmitting from a transmit-side STA a wireless packet by using a wireless channel (See Kasami e.g. access point, STAs, CSMA, packet transmitted, Lines 1-11 of ¶ [0005]). Further Kasami teaches the concept of setting, by the transmit-side STA (See Kasami e.g.

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Access point 1 of Fig. 1), time ($T_{\max} + T_s$) as transmission inhibition time (See Kasami e.g. inhibit transmission mode, Page 2, ¶ [0017]) to a paired wireless channel (See Kasami e.g. Page 12, ¶ [0166]) other than a wireless channel which requires longest transmission time T_{\max} among wireless channels used for simultaneous transmission, the transmission inhibition time used in the virtual carrier sense, the time ($T_{\max} + T_s$) obtained by adding predetermined time (See Kasami e.g. predetermined time, adding time, Page 5, ¶ [0085]) T_s to the longest transmission time T_{\max} (See Kasami e.g. $te_1 = ts_1 + Trs_1$, $te_2 = ts_2 + Trs_2$, and $te_3 = ts_3 + Trs_3$, $temax$, Fig. 1). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to provide above teaching of Kasami to APA to provide wireless communication apparatus for executing collision access control in accordance with Carrier Sense Multiple Access Collision Avoidance protocol, to transmit and receive data packets using first and second radio channels between the wireless communication apparatus and the first and second station units for determining effective transmission timing as suggested (See Kasami e.g. Page 2, ¶ [0019], Page 6, ¶ [0088]).

Regarding claims 6/4, 25/21, it is obvious that further comprising detecting, by the transmit-side STA, received power due to a leakage from a transmitting wireless channel in the paired wireless channel, and setting the transmission inhibition time Hirano e.g. communication setting means 4 of Fig. 1, timing control information of Fig. 1, transmission time IFS, idle time, time to be added, Page 1, ¶ [0009]) to a paired wireless channel which has received power greater than or equal to a predetermined threshold value (See Mochizuki e.g. RSSI detect, comparing carrier sense threshold value, determined to be equal or more than the threshold value, Page 2, Lines 6-12 of ¶ [0021], Fig. 4) or transmit-side STA includes a unit which detects received power (See Mochizuki e.g. RSSI detect, comparing carrier sense threshold value, determined to be equal or more than the threshold value, Page 2, Lines 6-12 of ¶ [0021], Fig. 4).

Regarding claims 7/4, 26/21, it is obvious that further comprising detecting, by said transmit-side STA, an error in a received signal in the paired wireless channel, and setting the transmission inhibition time to a paired wireless channel having the error detected (See Mochizuki e.g. local channel, paired (or adjacent) channels of Fig. 1, leakage adjacent channel power, Page 2, Lines 1-4 of ¶ [0024], and Fig. 4)

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or the transmit-side STA includes a unit which detects an error in a received signal (See Mochizuki e.g. RSSI detect, comparing carrier sense threshold value, Fig. 4).

Allowable Subject Matter

6. Claims 3, 5, 8/2, 9/2, 10/2, 11/2, 13/2,, 14/10/2, 15/14/10/2, 16/2, 17/2, 19, 22, 24, 27/21, 28/21 29/21, 30/21, 32/21, 33/29/21, 34/33/29/21, and 38, 39/13/2, 40/39/13/2, 41-42/32/21 are allowed.

7. Claims 3, 5, 8/2, 9/2, 10/2, 11/2, 13/2,, 14/10/2, 15/14/10/2, 16/2, 17/2, 19, 22, 24, 27/21, 28/21 29/21, 30/21, 32/21, 33/29/21, 34/33/29/21, 38, 39/13/2, 40/39/13/2, 41-42/32/21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With respect to claims 3, 19, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that the method comprising: setting, by the transmit-side STA, the time ($T_{max} + T_s$) to the paired wireless channel as a new transmission inhibition time when an existing set transmission inhibition time for the virtual carrier sense is smaller than the time ($T_{max} + T_s$).

With respect to claim 5, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that s the method comprising: setting, by the transmit-side STA, the time ($T_i + T_s$) to the paired wireless channel as a new transmission inhibition time when an existing set transmission inhibition time for the virtual carrier sense is smaller than the time ($T_i + T_s$).

With respect to claim 8/2, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that s the method comprising: when receiving a wireless packet over the paired wireless channel at the transmit-side STA, performing, by the transmit-side STA, an error detection to the received wireless packet: when a wireless channel having normally received a wireless packet directed to an own STA has the set transmission inhibition time, canceling the transmission inhibition time by the transmit-side STA; and when occupied time is set in a header of the received wireless packet, setting, by the transmit-side STA, a new transmission inhibition time in accordance with the occupied time.

With respect to claim 9/2, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that further comprising when there is a wireless channel having the set transmission inhibition time at the time of transmission data generation, transmitting, by the transmit-side STA, a wireless packet using the wireless channel determined to be idle after waiting until the transmission inhibition time elapses.

With respect to claim 10/2, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that by further comprising: when there are wireless channels having set transmission time at the time of transmission data generation, transmitting, by the transmit-side STA, a wireless packet using the wireless channel determined to be idle after waiting until the transmission inhibition time elapses when the longest transmission inhibition time is smaller than a predetermined threshold value; or transmitting, by the transmit-side STA, a wireless packet using the wireless channel determined to be idle without waiting until the transmission inhibition time elapses when the longest transmission inhibition time is greater than or equal to the predetermined threshold value.

With respect to claim 11/2, 16/2, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that further comprising when there is a wireless channel having the set transmission inhibition time at the time of transmission data generation, transmitting, by said transmit-side STA, a wireless packet using the wireless channel determined

to be idle with a predetermined probability without waiting until the transmission inhibition time elapses.

With respect to claim 13/2, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that further comprising: when transmission data is generated, transmitting, by the transmit-side STA, wireless packets using the wireless channels determined to be idle after waiting until all wireless channels are determined to be idle by the physical carrier sense and the virtual carrier sense; or transmitting, by the transmit-side STA, wireless packets using the wireless channels determined to be idle without waiting until the transmission inhibition time elapses when the longest transmission inhibition time of the set transmission inhibition time of wireless channels is greater than or equal to a predetermined threshold value.

With respect to claim 17/2, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that further comprising: when receiving a wireless packet having set transmission inhibition time, setting, by the receive-side STA, the transmission inhibition time to a wireless channel having received the wireless packet, and when normally receiving a wireless packet directed to an own STA, transmitting, by the receive-side STA, an ACK packet to the transmit-side STA, the ACK packet including the transmission inhibition time set in the paired wireless channel; and when receiving a corresponding ACK packet within a predetermined period of time after having transmitted the wireless packet, updating, by the transmit-side STA, transmission inhibition time set for the paired wireless channel to transmission inhibition time of the paired wireless channel included in the ACK packet.

With respect to claim 22, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that setting the time ($T_{max} + T_s$) as a new transmission inhibition time by the transmit-side STA when an existing set transmission inhibition time for the virtual carrier sense is smaller than the time ($T_{max} + T_s$).

With respect to claim 24, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that s the method comprising: when an existing set transmission

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inhibition time is smaller than the time ($T_i + T_s$), the virtual carrier sense unit of said transmit-side STA sets the time ($T_i + T_s$) to the paired wireless channel as a new transmission inhibition time.

With respect to claim 27/21, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that the transmit-side STA includes a unit which detects, when receiving a wireless packet over the paired wireless channel, an error in the received wireless packet; when a wireless channel having normally received a wireless packet directed to an own STA has the set transmission inhibition time, the virtual carrier sense unit cancels the transmission inhibition time; and when occupied time is set in a header of the received wireless packet, the virtual carrier sense unit sets a new transmission inhibition time in accordance with the occupied time.

With respect to claim 28/21, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that when transmission data is generated, the virtual carrier sense unit of the transmit-side STA transmits a wireless packet using said wireless channel determined to be idle after waiting until the transmission inhibition time elapses when there is a wireless channel having the set transmission inhibition time.

With respect to claim 29/21, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that when transmission data is generated, when the longest transmission inhibition time of the set transmission inhibition time of wireless channels is smaller than a predetermined threshold value, the virtual carrier sense unit of the transmit-side STA transmits a wireless packet using the wireless channel determined to be idle after waiting until the transmission inhibition time elapses; or when the longest transmission inhibition time is greater than or equal to the predetermined threshold value, the virtual carrier sense unit transmits a wireless packet using the wireless channel determined to be idle without waiting until the transmission inhibition time elapses.

With respect to claim 30/21, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that when there is a wireless channel having the set

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transmission inhibition time at the time of transmission data generation, the virtual carrier sense unit of said transmit-side STA transmits a wireless packet using the wireless channel determined to be idle, without waiting with a predetermined probability until the transmission inhibition time elapses.

With respect to claim 32/21, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that when transmission data is generated, when the longest transmission inhibition time of the set transmission inhibition time of wireless channels is smaller than a predetermined threshold value, the virtual carrier sense unit of the transmit-side STA transmits a wireless packet using the wireless channel determined to be idle after waiting until all the wireless channels are determined to be idle; or when the longest transmission inhibition time is greater than or equal to the predetermined threshold value, the virtual carrier sense unit transmits a wireless packet using the wireless channel determined to be idle without waiting until the transmission inhibition time elapses.

Allowable Subject Matter

8. Claims 8/1, 9/1, 10/1, 11/1, 14-15/10, 13/1, 39-40/13, 16/1, 17/1, 27/20, 29/20, 33-34/29, 30/20, 31/20, 32/20, 41-42/32, 35/20, 36/20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 8/1, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that further comprising: when receiving a wireless packet over the paired wireless channel at said transmit-side STA, performing, by the transmit-side STA, an error detection to the received wireless packet: when a wireless channel having normally received a

wireless packet directed to an own STA has the set transmission inhibition time, canceling the transmission inhibition time by said transmit-side STA; and when occupied time is set in a header of the received wireless packet, setting, by said transmit-side STA, a new transmission inhibition time in accordance with the occupied time.

Regarding claim 9/1, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that further comprising when there is a wireless channel having the set transmission inhibition time at the time of transmission data generation, transmitting, by the transmit-side STA, a wireless packet using the wireless channel determined to be idle after waiting until the transmission inhibition time elapses.

Regarding claim 10/1, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that further comprising: when there are wireless channels having set transmission time at the time of transmission data generation, transmitting, by the transmit-side STA, a wireless packet using said wireless channel determined to be idle after waiting until the transmission inhibition time elapses when the longest transmission inhibition time is smaller than a predetermined threshold value; or transmitting, by the transmit-side STA, a wireless packet using the wireless channel determined to be idle without waiting until the transmission inhibition time elapses when the longest transmission inhibition time is greater than or equal to the predetermined threshold value.

Regarding claim 11/1, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that further comprising when there is a wireless channel having the set transmission inhibition time at the time of transmission data generation, transmitting, by said transmit-side STA, a wireless packet using the wireless channel determined to be idle with a predetermined probability without waiting until the transmission inhibition time elapses.

Regarding claim 13/1, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that further comprising: when transmission data is generated, transmitting, by said transmit-side STA, wireless packets using the wireless channels determined to

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be idle after waiting until all wireless channels are determined to be idle by the physical carrier sense and the virtual carrier sense; or transmitting, by the transmit-side STA, wireless packets using the wireless channels determined to be idle without waiting until the transmission inhibition time elapses when the longest transmission inhibition time of the set transmission inhibition time of wireless channels is greater than or equal to a predetermined threshold value.

Regarding claim 16/1, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that further comprising when transmission data is generated, transmitting, by said transmit-side STA, a wireless packet using the wireless channel determined to be idle after waiting or without waiting with a predetermined probability until all wireless channels are determined to be idle by the physical carrier sense and said virtual carrier sense.

Regarding claim 17/1, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that further comprising: when receiving a wireless packet having set transmission inhibition time, setting, by said receive-side STA, the transmission inhibition time to a wireless channel having received the wireless packet, and when normally receiving a wireless packet directed to an own STA, transmitting, by said receive-side STA, an ACK packet to said transmit-side STA, the ACK packet including the transmission inhibition time set in the paired wireless channel; and when receiving a corresponding ACK packet within a predetermined period of time after having transmitted said wireless packet, updating, by said transmit-side STA, transmission inhibition time set for the paired wireless channel to transmission inhibition time of the paired wireless channel included in the ACK packet.

Regarding claim 27/20, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that the transmit-side STA includes a unit which detects, when receiving a wireless packet over the paired wireless channel, an error in the received wireless packet; when a wireless channel having normally received a wireless packet directed to an own STA has the set transmission inhibition time, the virtual carrier sense unit cancels the transmission inhibition time;

and when occupied time is set in a header of the received wireless packet, the virtual carrier sense unit sets a new transmission inhibition time in accordance with the occupied time.

Regarding claim 29/20, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that when transmission data is generated, when the longest transmission inhibition time of the set transmission inhibition time of wireless channels is smaller than a predetermined threshold value, the virtual carrier sense unit of the transmit-side STA transmits a wireless packet using the wireless channel determined to be idle after waiting until the transmission inhibition time elapses; or when the longest transmission inhibition time is greater than or equal to the predetermined threshold value, the virtual carrier sense unit transmits a wireless packet using the wireless channel determined to be idle without waiting until the transmission inhibition time elapses.

Regarding claim 30/20, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that when there is a wireless channel having the set transmission inhibition time at the time of transmission data generation, the virtual carrier sense unit of the transmit-side STA transmits a wireless packet using the wireless channel determined to be idle, without waiting with a predetermined probability until the transmission inhibition time elapses.

Regarding claim 31/20, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that when transmission data is generated, the physical carrier sense unit and the virtual carrier sense unit of the transmit-side STA transmit a wireless packet using said wireless channel determined to be idle after waiting until all the wireless channels are determined to be idle.

Regarding claim 32/20, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that when transmission data is generated, the physical carrier sense unit and the virtual carrier sense unit of the transmit-side STA transmit a wireless packet using the wireless channel determined to be idle after waiting until all the wireless channels are determined to be idle; or when the longest transmission inhibition time of the set transmission inhibition time of the wireless channels is greater than or equal to a predetermined threshold value, the physical carrier

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sense unit and the virtual carrier sense unit transmit a wireless packet using said wireless channel determined to be idle without waiting until the transmission inhibition time elapses.

Regarding claim 35/20, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that when transmission data is generated, the physical carrier sense unit and the virtual carrier sense unit of the transmit-side STA transmit a wireless packet using the wireless channel determined to be idle after waiting or without waiting with a predetermined probability until all the wireless channels are determined to be idle.

Regarding claim 36/20, the prior art of record as discussed above fails to disclose singly or in combination or render obvious that the receive-side STA includes a unit which sets transmission inhibition time to a wireless channel receiving a wireless packet when the received wireless packet has the set transmission inhibition time, and which transmits an ACK packet to said transmit-side STA when a wireless packet directed to the own STA has been normally received, the ACK packet including the transmission inhibition time set in the paired wireless channel; and the transmit-side STA includes a unit which updates the transmission inhibition time set for the paired wireless channel to transmission inhibition time of a paired wireless channel included in a corresponding ACK packet when receiving the ACK packet within a predetermined period of time after having transmitted the wireless packet.

Conclusion

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Kamran Afshar whose telephone number is (571) 272-7796. The examiner can be reached on Monday-Friday.

If attempts to reach the examiner by the telephone are unsuccessful, the examiner's supervisor, **Eng, George** can be reached @ (571) 272-7495. The fax number for the organization where this application or proceeding is assigned is **571-273-8300** for all communications.

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/Kamran Afshar/

Examiner, Art Unit 2617